



TETRA TECH

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October 29, 2014

Mr. James Johnson
On-Scene Coordinator
U.S. Environmental Protection Agency, Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

Subject: Data Deliverable Package 04
West Lake Landfill Site, Bridgeton, Missouri
CERCLIS ID: MOD079900932
EPA Region 7, START 4, Contract No. EP-S7-13-06, Task Order No. 0058
Task Monitor: James Johnson, On-Scene Coordinator

Dear Mr. Johnson:

Tetra Tech, Inc. is submitting the following dosimetry reports for thermoluminescent dosimeters (TLD) deployed at locations off-site of the West Lake Landfill Site in Bridgeton, Missouri for the listed monitoring periods. The TLDs deployed meet American National Standards Institute (ANSI) N545-1977, Nuclear Regulatory Commission (NRC) Regulatory Guide 4.13 and Health Physics Society (HPS) Draft Standard N13.29 for environmental dosimetry.

TLD Deployment Date	TLD Collection Date	Landauer Report Date
2014-04-29	2014-05-30	2014-06-10
2014-05-30	2014-07-01	2014-07-31
2014-07-01	2014-08-01	2014-08-13
2014-08-01	2014-09-02	2014-09-05
2014-09-02	2014-10-03	2014-10-10

The following table cross-references the off-site monitoring locations with the associated TLD identifiers referenced in the Landauer dosimetry reports.

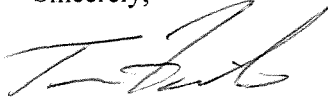
Monitoring Location	TLDs Deployed
Station 1: Robertson Fire Protection Station 2 3820 Taussig Road, Bridgeton, Missouri	AREA 1, AREA 2, AREA 3
Station 2: Pattonville Fire Department District 13900 St. Charles Rock Road, Bridgeton, Missouri	AREA 4, AREA 5, AREA 6
Station 3: Pattonville Fire Department District Station 2 3365 McKelvey Road, Bridgeton, Missouri	AREA 7, AREA, 8, AREA 9
Station 4: Spanish Village Park 12827 Spanish Village Drive, Bridgeton, Missouri	AREA 10, AREA 11, AREA 12
Station 5: St. Charles Fire Department Station #2 1550 S. Main Street, St. Charles, Missouri	AREA 13, AREA 14, AREA 15

Mr. James Johnson
October 29, 2014
Page 2

Please note that each dosimetry report also references a "Transit Control" badge, which is a control dosimeter that accompanies each shipment of TLD badges and is used to measure exposure during shipment only.

If you have any questions or comments, please contact Rob Monnig at (816) 412-1775.

Sincerely,



for Dave Kinroth
START Project Manager



Ted Faile, PG, CHMM
START Program Manager

Enclosures

US ENVIROMENTAL PROCT
 AGENCY JAMES JOHNSON
 FEDERAL ON-SCENE COORD
 212 LITTLE BUSSEN DRIVE
 FENTON, MO 63026

Report Date (YYYY-MM-DD)	2014-06-10
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Dosimeter Received	2014-06-06
QC Release	SBA
Analytical Work Order	1415611366

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 Customer Service: (800) 323-8830
 Technical: (800) 438-3241

Environmental Dosimetry Report

Account : 708876 Subaccount : 1431322 Series: X9

Location ID Number	Dosimeter Type	Identifier (Client Supplied)	Exposure (Ambient Dose mrem)		Net Cumulative Totals (mrem)			Inception Date (YYYY-MM)	Serial Number
			Gross	Net	Quarter to Date	Year to Date	Permanent		
Monitoring Period:			2014-05-01 to	2014-05-31	Q2	2014			
00000	V03NH	Deploy Control						2014-05	EX00069154R
	V03NH	Control Dose Used	8.2						
00001	V03NH	AREA 1	9.6	1.4				2014-05	EX00057807G
00002	V03NH	AREA 2	10.1	1.9				2014-05	EX00069161W
00003	V03NH	AREA 3	9.8	1.5				2014-05	EX00059333T
00004	V03NH	AREA 4	13.0	4.8				2014-05	EX00026880T
00005	V03NH	AREA 5	12.9	4.7				2014-05	EX00059420Y
00006	V03NH	AREA 6	12.7	4.5				2014-05	EX000104148
00007	V03NH	AREA 7	9.8	1.6				2014-05	EX000023273
00008	V03NH	AREA 8	10.4	2.2				2014-05	EX00012837Q
00009	V03NH	AREA 9	9.6	1.3				2014-05	EX00059564K
00010	V03NH	AREA 10	10.8	2.6				2014-05	EX00013719P
00011	V03NH	AREA 11	10.8	2.6				2014-05	EX000114254
00012	V03NH	AREA 12	11.1	2.8				2014-05	EX00006464Z
00013	V03NH	AREA 13	9.1	0.8				2014-05	EX000231561
00014	V03NH	AREA 14	9.2	1.0				2014-05	EX00060932Q
00015	V03NH	AREA 15	9.2	0.9				2014-05	EX000018513

General Information

The Environmental dosimeter is for both indoor and outdoor use, and is designed to withstand extremes of temperature, humidity, precipitation, and other environmental conditions. InLight dosimeters are built on an assembly of a case component with copper and plastic filters along with a four-positioned aluminum oxide detector slide component. Both the case and slide are uniquely bar coded with serial numbers for chain of custody and sensitivity identification. The InLight dosimeter is sealed within a heavy-duty vinyl tamper resistant pouch that has multiple slots to permit several methods of attachment for easy deployment.

Technical Specifications

- Fully meets ANSI N545-1977, NRC Regulatory Guide 4.13, and HPS Draft Standard N13.29 for environmental dosimetry.
- Minimum Detectable Dose - nominally 0.1 mrem (1 μ Sv), reporting to tenths of a millirem ambient dose equivalent.
- Detection Capabilities:
 - Photons (x and gamma rays) with energies above 15 keV nominally: 0.1 mrem to 1000 rem (1 μ Sv to 10 Sv).

Beta particles with energies greater than approximately 500 keV average energy: 20 mrem to 1000 rem (200 μ Sv to 10 Sv).

Control Dosimeter

A minimum of two control dosimeters are provided per shipment. The first is for field deployment/retrieval used to measure exposure during shipment and placement/collection. The second is for transit used to measure exposure during shipment only. Both control dosimeters assigned to a shipment should accompany that shipment both from and to Landauer. Do not use the control dosimeters for any other purpose. Store dosimeters away from radiation when not in use along with the control dosimeter(s) of the same use date.

Dosimetry reports show gross and net dosage. Gross dosage includes the dosage to the controls. Landauer's background subtraction protocol is:

- Subtract the deployment/retrieval control; or if not returned to Landauer
- Subtract the transit control.

Dosimetry Report Information

Location ID Number

Unique number assigned by Landauer.

Dosimeter Type

Dosimeter Type	Analytical Sensitivity	Minimum Detectable Dose Level (mrem)
V03NH	High	0.1
V03NN	Standard	5.0
V06NH	High	0.1
V06NN	Standard	5.0

Identifier

Location name supplied by customer.

Exposure Ambient Dose (mrem)

Gross: Gross exposure before control subtraction.

Net: Net exposure after control subtraction.

Net Cumulative Totals (mrem)

Quarter to Date, Year to Date, and Permanent are accumulated net ambient exposure.

Inception Date

The date Landauer began keeping dosimeter records for a given dosimeter for a monitoring location on the current account.

Serial Number

Dosimeter serial number.

U.S. Patents

6,316,782; 6,127,685; 5,892,234

Landauer, Inc.
2 Science Road
Glenwood, Illinois 60425-1586
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FENTON, MO 63026

Report Date (YYYY-MM-DD)	2014-06-10
Page	1 of 1
Dosimeter Received	2014-06-06
QC Release	SBA
Analytical Work Order	1415611366

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Environmental Dosimetry Report

Account : 708876

Location ID Number	Dosimeter Type	Identifier (Client Supplied)	Exposure (Ambient Dose mrem)		Net Cumulative Totals (mrem)			Inception Date (YYYY-MM)	Serial Number
			Gross	Net	Quarter to Date	Year to Date	Permanent		
Monitoring Period: 00000	V03NH	Transit Control	2014-05-01 to	2014-05-31	Q2	2014		2014-05	EX00064629F

General Information

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Dosimetry Report Information

Location ID Number

Unique number assigned by Landauer.

Dosimeter Type

Dosimeter Type	Analytical Sensitivity	Minimum Detectable Dose Level (mrem)
V03NH	High	0.1
V03NN	Standard	5.0
V06NH	High	0.1
V06NN	Standard	5.0

Identifier

Location name supplied by customer.

Exposure Ambient Dose (mrem)

Gross: Gross exposure before control subtraction.

Net: Net exposure after control subtraction.

Net Cumulative Totals (mrem)

Quarter to Date, Year to Date, and Permanent are accumulated net ambient exposure.

Inception Date

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Serial Number

Dosimeter serial number.

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Report Date (YYYY-MM-DD)	2014-07-31
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Dosimeter Received	2014-07-29
QC Release	CHA
Analytical Work Order	1420910062

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Environmental Dosimetry Report

Account : 708876 Subaccount : 1431322 Series: X9

Location ID Number	Dosimeter Type	Identifier (Client Supplied)	Exposure (Ambient Dose mrem)		Net Cumulative Totals (mrem)			Inception Date (YYYY-MM)	Serial Number
			Gross	Net	Quarter to Date	Year to Date	Permanent		
Monitoring Period:			2014-06-01 to	2014-06-30	Q2	2014			
00000	V03NH	Deploy Control						2014-05	EX00064792K
	V03NH	Control Dose Used	13.3						
00001	V03NH	AREA 1	14.7	1.4				2014-05	EX00022803Z
00002	V03NH	AREA 2	15.6	2.3				2014-05	EX00039622U
00003	V03NH	AREA 3	14.7	1.4				2014-05	EX00021052D
00004	V03NH	AREA 4	17.0	3.7				2014-05	EX00019874L
00005	V03NH	AREA 5	17.4	4.1				2014-05	EX00010485Z
00006	V03NH	AREA 6	17.7	4.4				2014-05	EX000243243
00007	V03NH	AREA 7	14.9	1.6				2014-05	EX00011595V
00008	V03NH	AREA 8	15.7	2.4				2014-05	EX00008409T
00009	V03NH	AREA 9	15.3	2.1				2014-05	EX000082245
00010	V03NH	AREA 10	16.0	2.7				2014-05	EX00014838M
00011	V03NH	AREA 11	16.4	3.1				2014-05	EX00058420Z
00012	V03NH	AREA 12	15.2	1.9				2014-05	EX00014219Y
00013	V03NH	AREA 13	14.4	1.1				2014-05	EX000270436
00014	V03NH	AREA 14	13.8	0.5				2014-05	EX00002859M
00015	V03NH	AREA 15	13.4	0.2				2014-05	EX00064621V

General Information

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- Subtract the transit control.

Dosimetry Report Information

Location ID Number

Unique number assigned by Landauer.

Dosimeter Type

Dosimeter Type	Analytical Sensitivity	Minimum Detectable Dose Level (mrem)
V03NH	High	0.1
V03NN	Standard	5.0
V06NH	High	0.1
V06NN	Standard	5.0

Identifier

Location name supplied by customer.

Exposure Ambient Dose (mrem)

Gross: Gross exposure before control subtraction.

Net: Net exposure after control subtraction.

Net Cumulative Totals (mrem)

Quarter to Date, Year to Date, and Permanent are accumulated net ambient exposure.

Inception Date

The date Landauer began keeping dosimeter records for a given dosimeter for a monitoring location on the current account.

Serial Number

Dosimeter serial number.

U.S. Patents

6,316,782; 6,127,685; 5,892,234

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415 OAK ST
KANSAS CITY, MO 64106

Report Date (YYYY-MM-DD)	2014-07-31
Page	1 of 1
Dosimeter Received	2014-07-29
QC Release	CHA
Analytical Work Order	1420910062

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Environmental Dosimetry Report

Account : 708876

Location ID Number	Dosimeter Type	Identifier (Client Supplied)	Exposure (Ambient Dose mrem)		Net Cumulative Totals (mrem)			Inception Date (YYYY-MM)	Serial Number
			Gross	Net	Quarter to Date	Year to Date	Permanent		
Monitoring Period: 00000	V03NH	Transit Control	2014-06-01 to	2014-06-30	Q2	2014		2014-05	EX000583102

General Information

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Technical Specifications

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- Detection Capabilities:
 - Photons (x and gamma rays) with energies above 15 keV nominally: 0.1 mrem to 1000 rem (1 μ Sv to 10 Sv).

Beta particles with energies greater than approximately 500 keV average energy: 20 mrem to 1000 rem (200 μ Sv to 10 Sv).

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- Subtract the transit control.

Dosimetry Report Information

Location ID Number

Unique number assigned by Landauer.

Dosimeter Type

Dosimeter Type	Analytical Sensitivity	Minimum Detectable Dose Level (mrem)
V03NH	High	0.1
V03NN	Standard	5.0
V06NH	High	0.1
V06NN	Standard	5.0

Identifier

Location name supplied by customer.

Exposure Ambient Dose (mrem)

Gross: Gross exposure before control subtraction.

Net: Net exposure after control subtraction.

Net Cumulative Totals (mrem)

Quarter to Date, Year to Date, and Permanent are accumulated net ambient exposure.

Inception Date

The date Landauer began keeping dosimeter records for a given dosimeter for a monitoring location on the current account.

Serial Number

Dosimeter serial number.

U.S. Patents

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Report Date (YYYY-MM-DD)	2014-08-13
Page	1 of 1
Dosimeter Received	2014-08-07
QC Release	SBA
Analytical Work Order	1421811682

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Environmental Dosimetry Report

Account : 708876 Subaccount : 1431322 Series: X9

Location ID Number	Dosimeter Type	Identifier (Client Supplied)	Exposure (Ambient Dose mrem)		Net Cumulative Totals (mrem)			Inception Date (YYYY-MM)	Serial Number
			Gross	Net	Quarter to Date	Year to Date	Permanent		
Monitoring Period:			2014-07-01 to	2014-07-31	Q3	2014			
00000	V03NH	Deploy Control						2014-05	EX00063992H
	V03NH	Control Dose Used	11.4						
00001	V03NH	AREA 1	11.6	0.2				2014-05	EX000107209
00002	V03NH	AREA 2	11.9	0.4				2014-05	EX00024729L
00003	V03NH	AREA 3	11.8	0.4				2014-05	EX00056570U
00004	V03NH	AREA 4	10.9	-0.5				2014-05	EX00009434Z
00005	V03NH	AREA 5	10.8	-0.7				2014-05	EX00008954O
00006	V03NH	AREA 6	11.0	-0.5				2014-05	EX00009068W
00007	V03NH	AREA 7	11.4	-0.1				2014-05	EX00060356S
00008	V03NH	AREA 8	11.5	0.0				2014-05	EX00058164T
00009	V03NH	AREA 9	11.5	0.1				2014-05	EX00012729P
00010	V03NH	AREA 10	12.3	0.9				2014-05	EX00059771L
00011	V03NH	AREA 11	12.4	0.9				2014-05	EX00062449J
00012	V03NH	AREA 12	12.4	1.0				2014-05	EX00008899C
00013	V03NH	AREA 13	10.9	-0.5				2014-05	EX00013090D
00014	V03NH	AREA 14	10.6	-0.9				2014-05	EX00013419V
00015	V03NH	AREA 15	11.1	-0.4				2014-05	EX00061416T

General Information

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Dosimeter Type

Dosimeter Type	Analytical Sensitivity	Minimum Detectable Dose Level (mrem)
V03NH	High	0.1
V03NN	Standard	5.0
V06NH	High	0.1
V06NN	Standard	5.0

Identifier

Location name supplied by customer.

Exposure Ambient Dose (mrem)

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KANSAS CITY, MO 64106

Report Date (YYYY-MM-DD)	2014-08-13
Page	1 of 1
Dosimeter Received	2014-08-07
QC Release	SBA
Analytical Work Order	1421811682

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Environmental Dosimetry Report

Account : 708876

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			Gross	Net	Quarter to Date	Year to Date	Permanent		
Monitoring Period: 00000	V03NH	Transit Control	2014-07-01 to	2014-07-31	Q3	2014		2014-05	EX00068961H

General Information

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Dosimetry reports show gross and net dosage. Gross dosage includes the dosage to the controls. Landauer's background subtraction protocol is:

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- Subtract the transit control.

Dosimetry Report Information

Location ID Number

Unique number assigned by Landauer.

Dosimeter Type

Dosimeter Type	Analytical Sensitivity	Minimum Detectable Dose Level (mrem)
V03NH	High	0.1
V03NN	Standard	5.0
V06NH	High	0.1
V06NN	Standard	5.0

Identifier

Location name supplied by customer.

Exposure Ambient Dose (mrem)

Gross: Gross exposure before control subtraction.

Net: Net exposure after control subtraction.

Net Cumulative Totals (mrem)

Quarter to Date, Year to Date, and Permanent are accumulated net ambient exposure.

Inception Date

The date Landauer began keeping dosimeter records for a given dosimeter for a monitoring location on the current account.

Serial Number

Dosimeter serial number.

U.S. Patents

6,316,782; 6,127,685; 5,892,234

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Report Date (YYYY-MM-DD)	2014-09-05
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Dosimeter Received	2014-09-04
QC Release	LCA
Analytical Work Order	1424710060

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Environmental Dosimetry Report

Account : 708876 Subaccount : 1431322 Series: X9

Location ID Number	Dosimeter Type	Identifier (Client Supplied)	Exposure (Ambient Dose mrem)		Net Cumulative Totals (mrem)			Inception Date (YYYY-MM)	Serial Number
			Gross	Net	Quarter to Date	Year to Date	Permanent		
Monitoring Period:			2014-08-01 to	2014-08-31	Q3	2014			
00000	V03NH	Deploy Control						2014-05	EX00013826S
	V03NH	Control Dose Used	10.4						
00001	V03NH	AREA 1	10.9	0.5				2014-05	EX0000613040
00002	V03NH	AREA 2	10.7	0.3				2014-05	EX000041675P
00003	V03NH	AREA 3	10.8	0.5				2014-05	EX000055917F
00004	V03NH	AREA 4	11.0	0.6				2014-05	EX000048607L
00005	V03NH	AREA 5	10.9	0.5				2014-05	EX000056778A
00006	V03NH	AREA 6	10.6	0.2				2014-05	EX000064851O
00007	V03NH	AREA 7	11.0	0.7				2014-05	EX000147213
00008	V03NH	AREA 8	11.0	0.7				2014-05	EX000026686L
00009	V03NH	AREA 9	10.8	0.4				2014-05	EX000051372Z
00010	V03NH	AREA 10	11.6	1.3				2014-05	EX000024327X
00011	V03NH	AREA 11	12.0	1.6				2014-05	EX000063069O
00012	V03NH	AREA 12	12.0	1.7				2014-05	EX000012511A
00013	V03NH	AREA 13	10.5	0.1				2014-05	EX000011332B
00014	V03NH	AREA 14	10.8	0.5				2014-05	EX000026156Y
00015	V03NH	AREA 15	10.4	0.0				2014-05	EX0000088003

General Information

The Environmental dosimeter is for both indoor and outdoor use, and is designed to withstand extremes of temperature, humidity, precipitation, and other environmental conditions. InLight dosimeters are built on an assembly of a case component with copper and plastic filters along with a four-positioned aluminum oxide detector slide component. Both the case and slide are uniquely bar coded with serial numbers for chain of custody and sensitivity identification. The InLight dosimeter is sealed within a heavy-duty vinyl tamper resistant pouch that has multiple slots to permit several methods of attachment for easy deployment.

Technical Specifications

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- Minimum Detectable Dose - nominally 0.1 mrem (1 μ Sv), reporting to tenths of a millirem ambient dose equivalent.
- Detection Capabilities:
 - Photons (x and gamma rays) with energies above 15 keV nominally: 0.1 mrem to 1000 rem (1 μ Sv to 10 Sv).

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Dosimetry Report Information

Location ID Number

Unique number assigned by Landauer.

Dosimeter Type

Dosimeter Type	Analytical Sensitivity	Minimum Detectable Dose Level (mrem)
V03NH	High	0.1
V03NN	Standard	5.0
V06NH	High	0.1
V06NN	Standard	5.0

Identifier

Location name supplied by customer.

Exposure Ambient Dose (mrem)

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Net: Net exposure after control subtraction.

Net Cumulative Totals (mrem)

Quarter to Date, Year to Date, and Permanent are accumulated net ambient exposure.

Inception Date

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Serial Number

Dosimeter serial number.

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Report Date (YYYY-MM-DD)	2014-09-05
Page	1 of 1
Dosimeter Received	2014-09-04
QC Release	LCA
Analytical Work Order	1424710060

Location ID Number	Dosimeter Type	Identifier (Client Supplied)	Exposure (Ambient Dose mrem)		Net Cumulative Totals (mrem)			Inception Date (YYYY-MM)	Serial Number
			Gross	Net	Quarter to Date	Year to Date	Permanent		
Monitoring Period: 00000	 V03NH	 Transit Control	2014-08-01 to	2014-08-31	Q3	2014		2014-05	EX00063038T

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Dosimetry Report Information

Location ID Number

Unique number assigned by Landauer.

Dosimeter Type

Dosimeter Type	Analytical Sensitivity	Minimum Detectable Dose Level (mrem)
V03NH	High	0.1
V03NN	Standard	5.0
V06NH	High	0.1
V06NN	Standard	5.0

Identifier

Location name supplied by customer.

Exposure Ambient Dose (mrem)

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Net Cumulative Totals (mrem)

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Report Date (YYYY-MM-DD)	2014-10-10
Page	1 of 1
Dosimeter Received	2014-10-08
QC Release	LCA
Analytical Work Order	1428010476

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Environmental Dosimetry Report

Account : 708876 Subaccount : 1431322 Series: X9

Location ID Number	Dosimeter Type	Identifier (Client Supplied)	Exposure (Ambient Dose mrem)		Net Cumulative Totals (mrem)			Inception Date (YYYY-MM)	Serial Number
			Gross	Net	Quarter to Date	Year to Date	Permanent		
Monitoring Period:			2014-09-01 to	2014-09-30	Q3	2014			
00000	V03NH	Deploy Control						2014-05	EX00064974E
	V03NH	Control Dose Used	9.0						
00001	V03NH	AREA 1	8.5	-0.5				2014-05	EX00041525W
00002	V03NH	AREA 2	9.1	0.2				2014-05	EX000710036
00003	V03NH	AREA 3	8.7	-0.3				2014-05	EX00056839A
00004	V03NH	AREA 4	10.1	1.2				2014-05	EX00028666L
00005	V03NH	AREA 5	10.0	1.1				2014-05	EX00071332Z
00006	V03NH	AREA 6	9.9	1.0				2014-05	EX00052868D
00007	V03NH	AREA 7	10.3	1.3				2014-05	EX00064244V
00008	V03NH	AREA 8	10.3	1.3				2014-05	EX00059395J
00009	V03NH	AREA 9	10.0	1.0				2014-05	EX00059338J
00010	V03NH	AREA 10	11.4	2.4				2014-05	EX00005297V
00011	V03NH	AREA 11	11.3	2.4				2014-05	EX00042220B
00012	V03NH	AREA 12	11.4	2.4				2014-05	EX00015081A
00013	V03NH	AREA 13	10.7	1.7				2014-05	EX00060885H
00014	V03NH	AREA 14	9.9	0.9				2014-05	EX00064829B
00015	V03NH	AREA 15	9.8	0.9				2014-05	EX00061844M

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Report Date (YYYY-MM-DD)	2014-10-10
Page	1 of 1
Dosimeter Received	2014-10-08
QC Release	LCA
Analytical Work Order	1428010476

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Environmental Dosimetry Report

Account : 708876

Location ID Number	Dosimeter Type	Identifier (Client Supplied)	Exposure (Ambient Dose mrem)		Net Cumulative Totals (mrem)			Inception Date (YYYY-MM)	Serial Number
			Gross	Net	Quarter to Date	Year to Date	Permanent		
Monitoring Period: 00000	V03NH	Transit Control	2014-09-01 to	2014-09-30	Q3	2014		2014-05	EX00064353U

General Information

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